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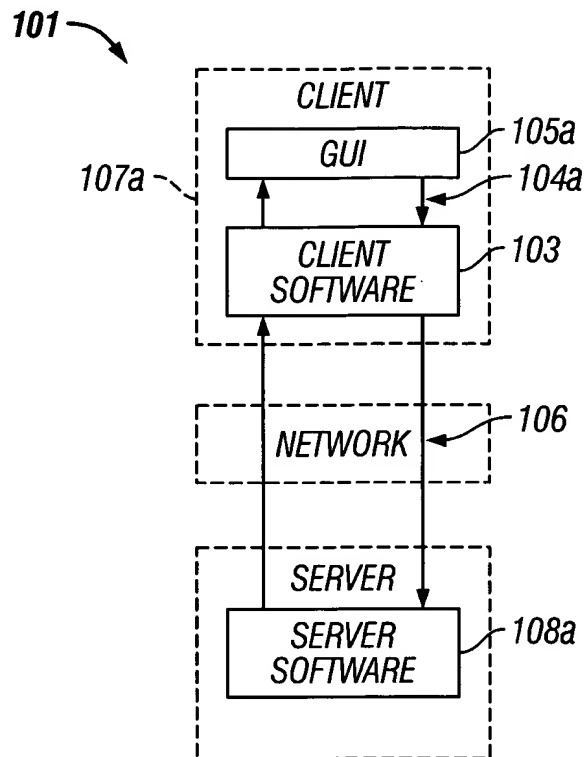


FIG. 1A

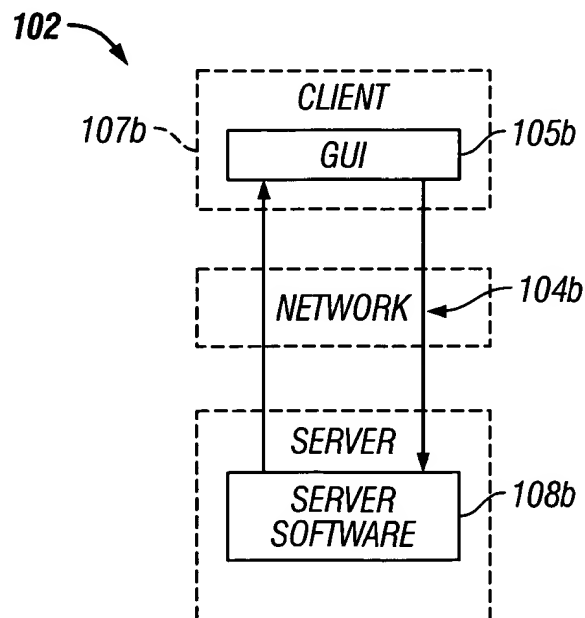


FIG. 1B

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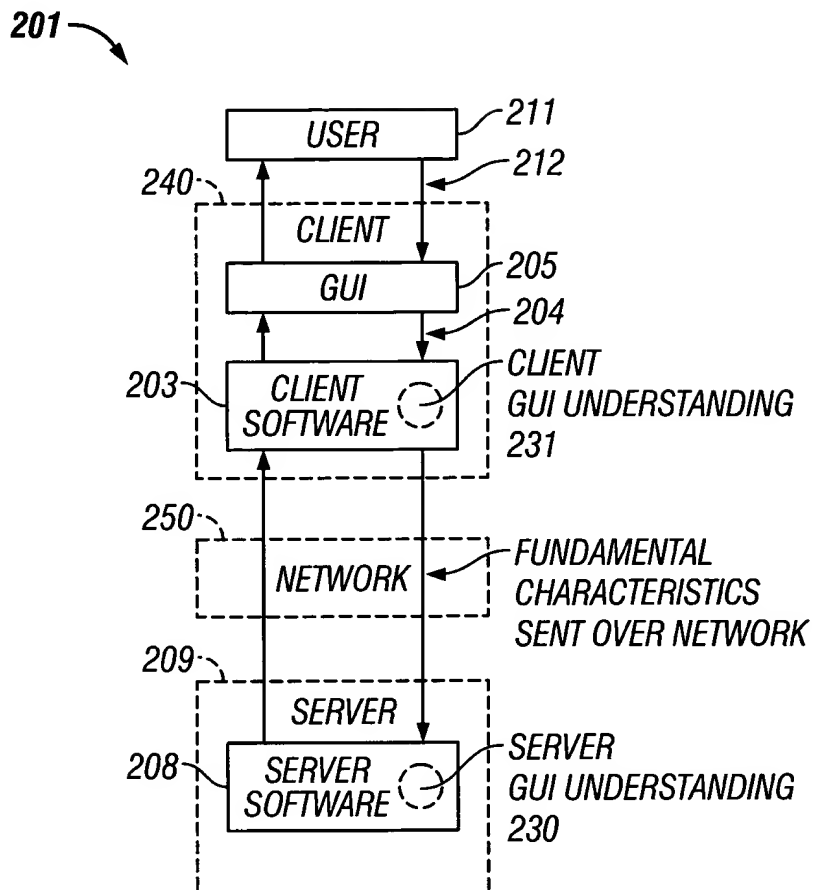


FIG. 2

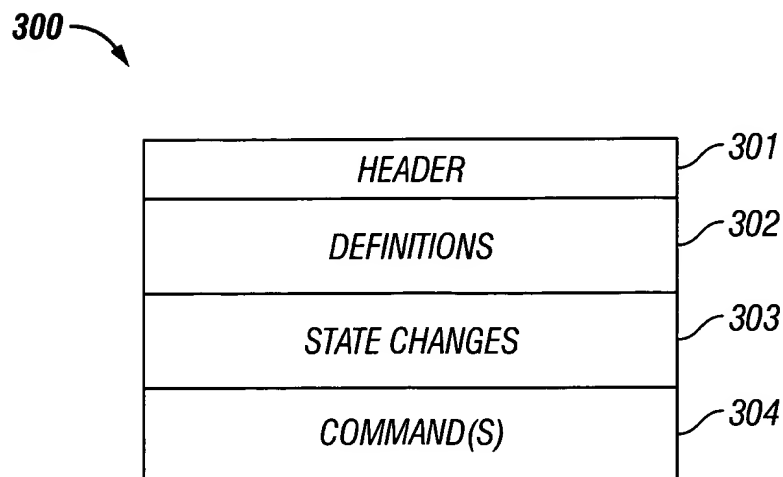


FIG. 3

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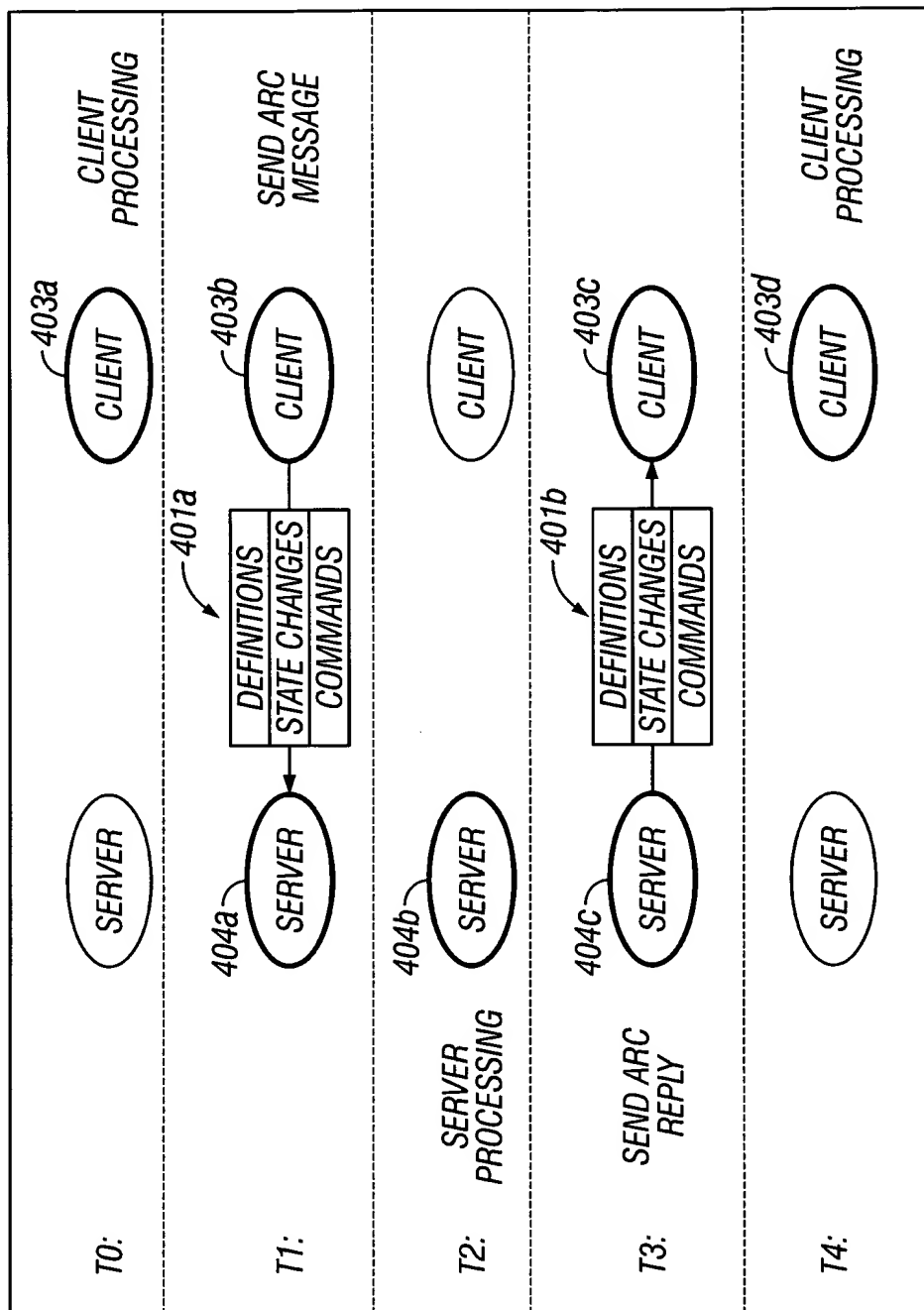


FIG. 4

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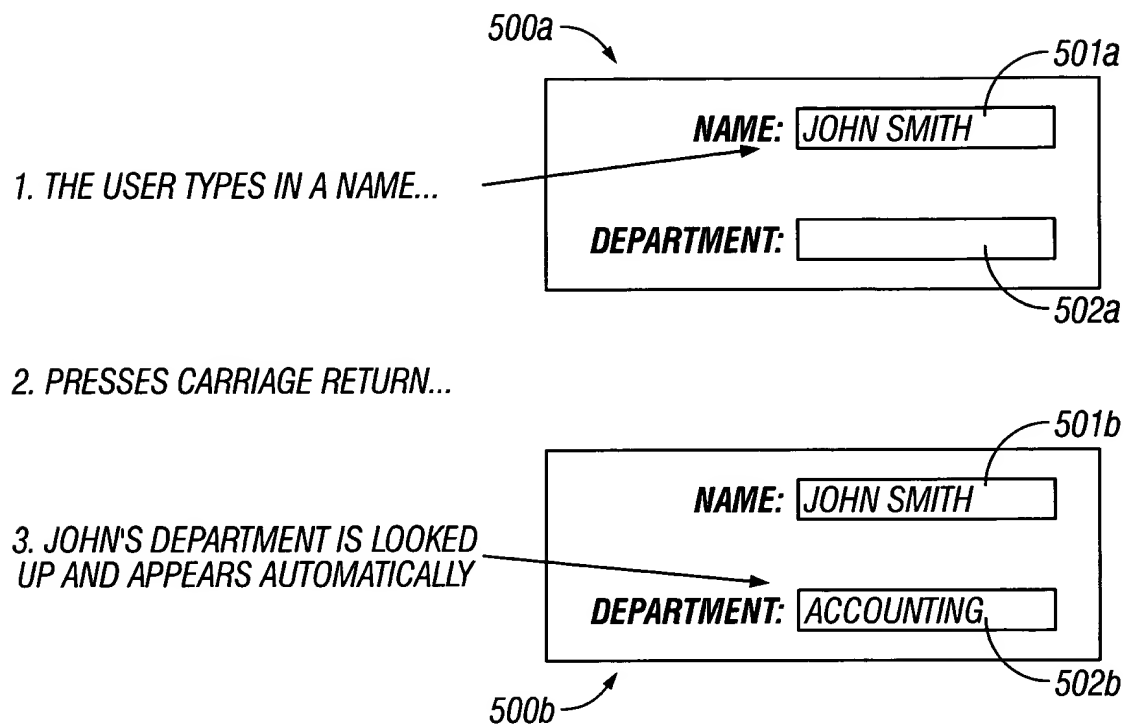


FIG. 5

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<b>TIME</b>	<b>CLIENT</b>	<b>SERVER</b>
<i>T0</i>	<i>SEND "RUNAPPLICATION" COMMAND. NO DEFINITIONS, NO STATE CHANGES.</i>	
<i>T1</i>		<i>APPLICATION LOADED AND INITIALIZED ON SERVER. SEND REPLY MESSAGE WITH NEW DEFINITIONS SUPPLIED (FORM, FIELDS). NO STATE CHANGES OR COMMANDS.</i>
<i>T2</i>	<i>PROCESS NEW DEFINITIONS (CREATE THE FORM IN THE DISPLAY ACCORDING TO SPECIFICATION).</i>	
<i>T3</i>	<i>PROCESS ANY STATE CHANGES (NONE).</i>	
<i>T4</i>	<i>PROCESS ANY COMMANDS (NONE).</i>	
<i>T5</i>	<i>WAIT FOR USER INTERACTION.</i>	
<i>T6</i>	<i>USER TYPES IN "JOHN SMITH". CLIENT FLAGS NAME FIELD AS HAVING VALUE STATE CHANGE.</i>	
<i>T7</i>	<i>USER PRESSES RETURN KEY.</i>	
<i>T8</i>	<i>CLIENT SENDS RETURNKEYPRESSED COMMAND MESSAGE. INCLUDES ALL STATE CHANGES IN MESSAGE (IN THIS CASE, THE NAME FIELD VALUE), AND UNFLAGS ALL STATE CHANGES.</i>	

**FIG. 6**

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<i>T9</i>		<i>NEW DEFINITIONS APPLIED (NONE).</i>
<i>T10</i>		<i>STATE CHANGES APPLIED (NAME FIELD HAS VALUE "JOHN SMITH").</i>
<i>T11</i>		<i>COMMANDS PROCESSED. IN THIS CASE, THE RETURNKEYPRESSED COMMAND CAUSES THE BUSINESS RULE TO BE FIRED. DURING THE PROCESSING, THE DATABASE LOOKUP OCCURS, AND THE SERVER'S DEPARTMENT FIELD VALUE IS CHANGED TO "ACCOUNTING". THAT FIELD IS FLAGGED AS HAVING VALUE STATE CHANGE.</i>
<i>T12</i>		<i>SEND REPLY MESSAGE. DEFINITIONS (NONE), STATE CHANGES (IN THIS CASE, THE DEPARTMENT FIELD VALUE), AND UNFLAGS ALL STATE CHANGES.</i>
<i>T13</i>	<i>PROCESS NEW DEFINITIONS (NONE).</i>	
<i>T14</i>	<i>PROCESS STATE CHANGES (DEPARTMENT FIELD GIVEN VALUE "ACCOUNTING").</i>	
<i>T15</i>	<i>PROCESS ANY COMMANDS (NONE).</i>	

**FIG. 6**  
**(Continued)**

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# **COMMANDS**

"LOGIN"	VALIDATE USER AND BEGIN SESSION.
"LOGOUT"	TERMINATE SESSION.
"GET TASK LIST"	REQUEST TASK LIST DEFINITIONS - I.E. ACTIVITIES THE USER CAN EXPLICITLY CHOOSE TO INITIATE FROM A CENTRAL PLACE.
"RUN TASK"	AN ITEM FROM THE TASK LIST HAS BEEN CHOSEN, SO OPEN THE CORRESPONDING WINDOW, CUSTOM PACKAGE, OR GUIDE. A "WINDOW" CONTAINS A FORM IN QUERY, SUBMIT, OR MODIFY MODE. AN "CUSTOM PACKAGE" CONTAINS LIST OF FORMS, START FORM, START MODE, ASSOCIATED ICON, ETC. SO OPENING IT OPENS ITS START FORM. A "GUIDE" IS A SEQUENCE OF PROGRAMMABLE RULE ACTIONS ENCAPSULATED INTO A SINGLE COMMAND, WHICH CAN LEAD THE USER THROUGH A FORM FILL-IN ACTIVITY IN A STEP-BY-STEP PROCESS (OR ANY OTHER ACTIVITY THAT CAN BE "SCRIPTED" USING PROGRAMMABLE RULES).
"GET SCHEMA WINDOW"	REQUEST WINDOW DEFINITION CONTAINING A FORM. THESE WINDOWS HAVE AN ASSOCIATED MODE (QUERY, MODIFY, SUBMIT NEW), AND CAN BE ONE PANE OF A WINDOW INCLUDING A QUERY LIST WINDOW.
"GET MENU BY FIELD ID"	EXPAND A PROGRAMMABLE MENU WHICH IS ASSOCIATED WITH A DATA FIELD.
"CLOSE WINDOW"	CLOSE A WINDOW CURRENTLY OPEN.
"GET QUERY LIST WINDOW"	REQUEST A WINDOW DEFINITION CONTAINING A QUERY RESULT. THIS CAN BE ONE PANE OF A CONTAINING WINDOW WHICH ALSO CONTAINS A SCHEMA WINDOW.
"NEW DISPLAY WINDOW"	OPEN A WINDOW CONTAINING FORM IN READ-ONLY MODE.
"REFRESH QUERY LIST"	RUN A QUERY AGAIN SO THAT A RESULTS WINDOW CONTAINS UP-TO-DATE DATA.
"SUBMIT"	THE "SUBMIT" MENU OR TOOLBAR BUTTON WAS PRESSED.
"QUERY"	THE "QUERY" MENU OR TOOLBAR BUTTON WAS PRESSED.
"MODIFY"	THE "MODIFY" MENU OR TOOLBAR BUTTON WAS PRESSED.
"GET SCHEMA HELP"	REQUEST WINDOW DEFINITION CONTAINING HELP FOR A DB-SCHEMA.
"GET FIELD HELP"	REQUEST WINDOW DEFINITION CONTAINING HELP FOR A FIELD WITHIN A DB-SCHEMA.
"RETURN KEY"	THE RETURN KEY WAS PRESSED.
"MENU CHOICE"	A DATA MENU ITEM WAS SELECTED.
"CONTROL FIRED"	A PROGRAMMABLE MENU, TOOLBAR BUTTON, OR FORM BUTTON WAS PRESSED.
"SET DEFAULT"	THE "SET TO DEFAULT" MENU OR TOOLBAR BUTTON WAS PRESSED.

**FIG. 7**

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"DISPLAY PICK LIST"	PRESENT THE USER WITH A PICKLIST (A LIST OF DATA ITEMS RETURNED BY A QUERY, MODALLY DISPLAYED) AND REQUEST THE CHOSEN VALUE BE RETURNED VIA A "SELECT PICK LIST" COMMAND.
"SELECT PICK LIST"	AN ITEM WAS SELECTED FROM A PICKLIST.
"OPEN URL"	A URL EMBEDDED IN A FORM WINDOW WAS CLICKED. CAUSED THE URL TO BE NAVIGATED TO IN THE USER'S WEB BROWSER.
"PROMPT USER"	THE USER IS TO BE PROMPTED TO CHOOSE BETWEEN A SET OF CHOICES.
"PROMPT RESPONSE"	THE USER HAS CHOSEN FROM A PROMPT.
"CANCEL"	A PROMPT HAS BEEN RESPONDED TO BY THE "CANCEL" CHOICE.
"MESSAGE BOX"	A MESSAGE IS TO BE DISPLAYED TO THE USER.
"LOAD ENTRY"	REQUEST A FORM WINDOW TO LOAD ENTRY BY SPECIFYING THE OFFSET INTO A QUERY RESULT LIST.
"LOAD ENTRY BY ID"	REQUEST A FORM WINDOW TO LOAD ENTRY BY SPECIFYING A UNIQUE ENTRY ID.
"OPEN ATTACHMENT"	AN ATTACHMENT HAS BEEN SELECTED FOR DISPLAY.
"GAIN FOCUS"	A FIELD ON A FORM HAS GAINED INPUT FOCUS.
"LOSE FOCUS"	A FIELD ON A FORM HAS LOST INPUT FOCUS.
"SWITCH MODE"	A FORM WINDOW IS CHANGING MODE, E.G. FROM QUERY TO SUBMIT.
"DRILL DOWN"	IN A RESULTS LIST OR TABLE FIELD, AN ENTRY HAS BEEN SELECTED FOR EXPANDED DISPLAY.
"REFRESH FIELD"	UPDATE THE CONTENTS OF A FIELD FROM THE DATABASE.
"COPY TO NEW"	THE "COPY TO NEW" MENU OR TOOLBAR BUTTON WAS PRESSED.
"DO NAMED SEARCH"	A PARTICULAR NAMED SEARCH HAS BEEN REQUESTED. THESE ARE STORED QUERIES THAT CAN BE EXECUTED ON COMMAND.
"KEEP ALIVE SESSION"	RESET THE SESSION TIMEOUT. THIS ENABLES THE SERVER TO CLEAN UP INACTIVE SESSIONS.
"CLOSE CONFIRMATION"	PROMPT THE USER TO CONFIRM CLOSE OF AN UNCOMMITTED WINDOW.
"SELECT CLOSE CONFIRMATION"	THE USER RESPONSE TO A CLOSECONFIRMATION REQUEST.

**FIG. 7**  
**(Continued)**



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STATES	
"SESSION - WINDOW LIST"	LIST OF ALL WINDOWS, WHETHER THEY ARE CURRENTLY OPEN, CLOSED.
"WINDOW - FOCUSFIELD"	FIELD WHICH CURRENTLY HAS INPUT FOCUS FOR THAT WINDOW.
"WINDOW - ENTRIES"	THE RESULT OF A QUERY IN A RESULT LIST WINDOW (ROWS OF DATA).
"WINDOW - SELECTEDENTRIES"	IN A RESULT LIST OR TABLE FIELD, THE CURRENTLY SELECTED ENTRIES.
"WINDOW - GUIDEWAIT"	WHETHER OR NOT THE USER IS CURRENTLY PROMPTED IN THE CONTEXT OF A GUIDE.
"WINDOW - PROMPTTEXTLIST"	THE CURRENT CONTENTS OF THE PROMPT PANE WHILE RUNNING A GUIDE.
"WINDOW - CHANGEFLAG"	WHETHER OR NOT THE WINDOW IS CURRENTLY MARKED AS MODIFIED.
"WINDOW- PROMPTWINDOWSTATE"	WHETHER OR NOT THE PROMPT PANE IS VISIBLE. THE PROMPT PANE IS AN OPTIONAL PART OF A SCHEMA WINDOW WHICH CAN DISPLAY MESSAGES MODELESSLY, AND IS FREQUENTLY USED BY FORM-FILL-IN GUIDES.
"FIELD - VALUE"	THE CURRENT VALUE OF A FIELD (CAN BE DIFFERENT TYPES).
"FIELD - DISPLAY - VISIBLE"	VISIBLE VS. HIDDEN FOR A FIELD.
"FIELD - DISPLAY - ACCESS"	READ-WRITE VS. READ-ONLY VS. DISABLED FOR A FIELD.
"FIELD - DISPLAY - "MENU"NAME"	THE CURRENT DATA MENU ASSOCIATED WITH A FIELD.
"FIELD - DISPLAY - LABELCOLOR"	THE CURRENT COLOR OF THE LABEL ASSOCIATED WITH A FIELD.
"FIELD - STATISTVALUE"	THE CURRENT CONTENTS OF A SPECIAL VALUE TYPE. THIS IS THE AUDIT TRAIL OF CHANGES TO AN ENUM "STATUS" FIELD, ENCODED INTO A SPECIAL FORMAT.
"FIELD - DIARYVALUE"	THE CURRENT CONTENTS OF A SPECIAL VALUE TYPE. THIS IS AN APPEND-ONLY CHARACTER FIELD WHICH ALWAYS ADDS USER/TIMESTAMP WHENEVER AN APPEND OCCURS. THE PREVIOUS ENTRIES ARE READ-ONLY.
"FIELD - TABLEFIELDVALUE"	THE CURRENT CONTENTS OF A SPECIAL VALUE TYPE. THIS IS AN EMBEDDED QUERY RESULT LIST WHICH CONTAINS A LIST OF ENTRY DATA WHICH CAN CHANGE BY A "REFRESH FIELD" COMMAND.
"FIELD - ATTACHFIELDVALUE"	THE CURRENT CONTENTS OF A SPECIAL VALUE TYPE. THIS IS A REFERENCE TO, AND ATTRIBUTES OF, A FILE STORED ON THE SERVER WHICH CAN BE DOWNLOADED FOR DISPLAY BY THE OPERATING SYSTEM (OR BROWSER).
"FIELD - TABLEROWSELECTION"	WHICH ROWS OF A TABLE FIELD ARE CURRENTLY SELECTED. THIS REFERS TO THE USER'S ABILITY TO DO MULTIPLE SELECTION OPERATIONS ON A TABLE FIELD, AND THE ABILITY OF PROGRAMMABLE RULES TO BE AFFECTED BY SUCH SELECTION.

FIG. 8

DEFINITIONS

"SESSION ID"	UNIQUE SESSION IDENTIFICATION STRUCTURE
"TASK LIST"	LIST OF AVAILABLE FORMS, GUIDES, CUSTOM PACKAGES.
"FIELD DEFINITIONS"	FIELD TYPE, LAYOUT, VALIDATION RANGE, DISPLAY PROPERTIES, ETC. ALL THE INFORMATION TO CREATE A TYPED DATA FIELD ON A FORM. CAN INCLUDE DATA FIELDS OF TYPE CHARACTER, DIARY, INTEGER, REAL/DECIMAL, ENUM SELECTION, DATE/TIME, ATTACHMENT, AND ALSO STATIC TRIM ELEMENTS SUCH AS LINES, BOXES, TEXT LABELS, TAB CONTROLS, AND DATA TABLE FIELD (A QUERY RESULT LIST EMBEDDED WITHIN A FORM).
"MENU DEFINITIONS"	HIERACHICAL DATA MENU DESCRIPTION WHICH CAN BE ATTACHED TO A FIELD. LABELS FOR ITEMS, VALUE FOR ITEMS, NESTED SUBMENUS.
"RESULTS LIST DEFINITIONS"	QUERY RESULTS WINDOW DESCRIPTION (E.G. COLUMN TITLES).
"FIELD HELP"	THE HELP TEXT PROVIDED FOR FIELD BY THE CUSTOM PACKAGE AUTHOR.
"NEW ENTRY ID"	THE ID OF A NEW ENTRY (FOR IMPLEMENTATIONS IN WHICH EACH ENTRY HAS EXACTLY ONE WINDOW).
"SCHEMA HELP"	THE HELP TEXT PROVIDED FOR A FORM.
"TASK CUSTOM PACKAGE"	DESCRIPTION OF CUSTOM PACKAGE ENTRY POINT.

FIG. 9